Space Weather Forecast

Issued on Monday, 23 October 2023 at 01:12 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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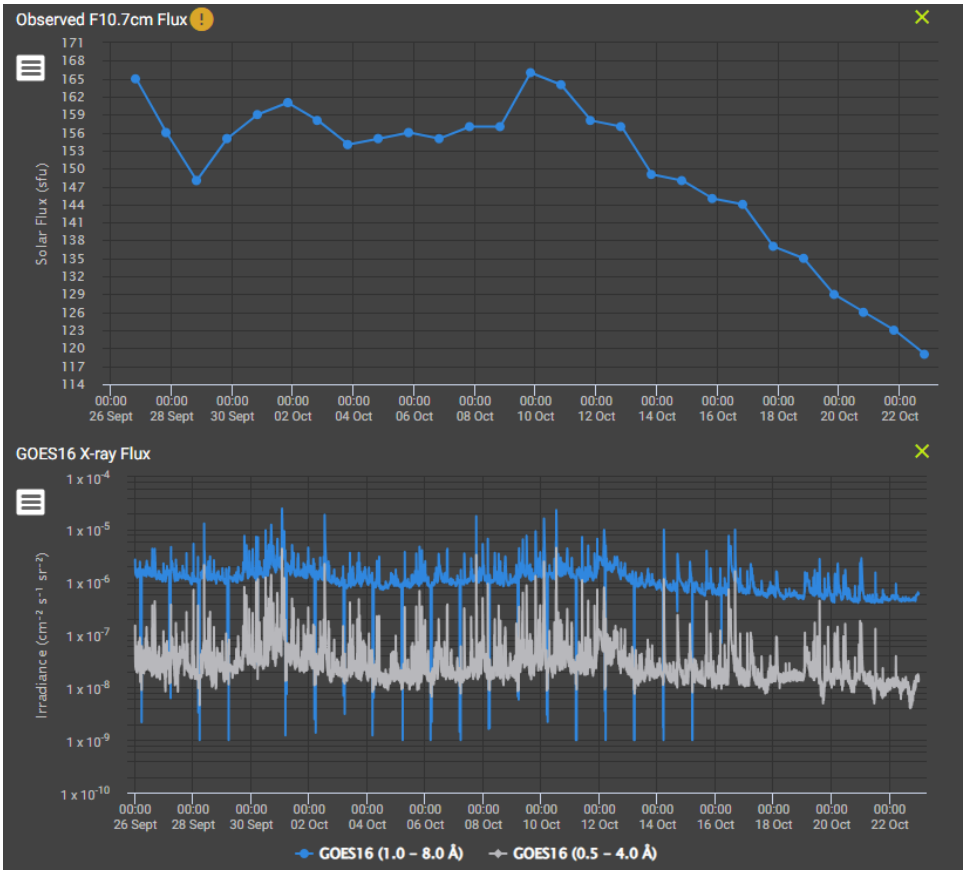
Space Weather Forecast Headline: No significant activity.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been very low over the past 24 hours, with no significant flares seen and with an X-ray trace reminiscent of solar minimum. There are currently up to five sunspot regions on the facing side of the Sun, all of which are small, magnetically simple and stable.

Figure 1: 10.7cm radio flux – a proxy for sunspot number and activity as well as observed X-ray flares in the past month. The 10.7cm value is currently at a minimum for the calendar year.



The only Coronal Mass Ejection (CME) activity in the period was far-sided: both from beyond the western solar horizon but also a notably large 'prominence eruption' (arc of plasma) from the northeast around 22/2200UTC. No Earth-directed CMEs have been seen in imagery during the last 24 hours.

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Solar Wind / Geomagnetic Activity: The solar wind was a little disturbed but with an uncertain mechanism. Overall, glancing incidence from a Coronal Mass Ejection shock early in the period is not beyond possibility, perhaps with later entry into a minor stream of fast wind, although the latter is uncertain.

The solar wind speed showed an overall upward trend within background levels. The number of particles in the solar wind rose slightly early in the period, but soon plateaued within background. The magnetic field was somewhat erratic in character and magnitude, peaking at slightly elevated levels.

The net result of the above solar wind measures was nevertheless provisionally quiet throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain low or very low, with a slight chance of isolated Common-class flares that may increase a little through the coming UTC working week.

Solar Wind / Geomagnetic Activity: No significant CMEs feature in the forecast. The forecast is for mainly quiet geomagnetic activity. Up to two fast wind streams are due, a low confidence and low impact feature perhaps due later in the first 24 hours, and then a more probable slight chance of Minor Geomagnetic Storm G1 arising from a second 'coronal hole' after midweek UTC.

Energetic Particles / Solar Radiation: No solar radiation storms are likely.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	5	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

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Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	5	10	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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